REMARKS / ARGUMENTS

This application is believed to be in condition for allowance because the claims are non-obvious and patentable over the cited references. The following paragraphs provide the justification for this belief. In view of the following reasoning for allowance, the Applicant hereby respectfully requests further examination and reconsideration of the subject patent application.

1.0 Amendments to Dependent Claims 8 and 17:

During the Examiner Interview of January 31, 2008, the Examiner requested that Applicants amend claims 8 and 17 to specifically define the term "full rank." In response, applicants have amended each of these claims to refer to matrices as having full rank "…such that the rank of each… vector is the same as the smallest dimension of that vector."

As previously explained by the Applicants, the term "full rank" is well known to those skilled in the art of conventional linear algebra. In particular, the ***rank*** of an arbitrary $m \times n$ matrix is at most the lesser of m and n. An $m \times n$ matrix that has as large a rank as possible is said to have ***full rank***. In other words, any matrix having a rank that is equal to the smallest dimension of that matrix, is said to have full rank. Since this concept is well known to those skilled in the art, as evidenced by the various text book excerpts provided in Applicants prior response, no new matter has been added by way of the present amendment, and no changes to the specification are required to support the present amendments.

Further, it should also be noted that in the Advisory Action dated January 22, 2008, the Examiner withdrew his objection to the specification and claims with respect to the use of the term "full rank."

2.0 Rejections under 35 U.S.C. §102:

In the Final Office Action of October 3, 2007, claims 7-9 and 16-18 were rejected under 35 U.S.C. §102(e) as being anticipated by "network Information Flow", IEEE Transactions on Information Theory by R. Ahlswede, et al., hereinafter "***Ahlswede***."

A rejection under 35 U.S.C. §102(e) requires that the Applicant's invention was described in patent granted on an application for patent by another filed in the United States before the invention thereof by the Applicant. To establish that a patent describes the Applicant's invention, *all of the claimed elements of an Applicant's invention must be considered, especially where they are missing from the prior art*. If a claimed element is not taught in the referenced patent, then a rejection under 35 U.S.C. §102(e) is not proper, as the Applicants' invention can be shown to be patentably distinct from the cited reference.

In view of the following discussion, the Applicants will show that one or more elements of the Applicants' claimed invention are missing from the cited art, and that the Applicants' invention is therefore patentable over that cited art.

2.1 Rejection of Claims 7-9:

In general, the Office Action rejected independent claim 7 under 35 U.S.C. §102(e) based on the rationale that the ***Ahlswede*** reference teaches the Applicant's claimed "…system for computing a network code…"

One important issue in the rejection of independent claim 7 is the definition of the term "representation vectors" as specifically defined by the Applicants. Applicants have amended claim 7 to refer to an "encoding vector rather than a "representation vector," and have further defined the terms associated with the claimed "encoding vector." Applicants believe that this, and other clarifying language added to independent claim 7 will assist in a further and more accurate examination of the claims.

In particular, Applicants believe that the clarifying language will assist in a better understanding of how the claimed "encoding vectors" differ from the "R" values described by the ***Ahlswede*** reference. As noted in the Interview Summary dated February 4, 2008, the Examiner suggested that Applicants explain how the representation vectors are not the R values of the ***Ahlswede*** reference. Applicants believe that in view of the amendments to claim 7, this issue has now been clarified.

In particular, the Office Action suggests that the claimed limitation of "computing representation vectors…" is disclosed by the ***Ahlswede*** reference. Specifically, the Office Action offers page 1204 of the ***Ahlswede*** reference and suggests "R is the vector; the symbols are the length of the bits sent." However, as previously noted by the Applicants, the ***Ahlswede*** reference describes the "vector R" as simply the "coding rate" for a particular edge of the multicast network.

In contrast, Applicants are claiming "…computing a set of linear combination coefficients for each edge entering each node, each set of linear combination coefficients representing an ***encoding vector*** for each edge for encoding symbols transmitted along each corresponding edge…" and "wherein each symbol provides a ***symbolic representation of one or more encoded bits of data***, and wherein each symbol belongs to a finite library of symbols…"

As such, the coding rate "R" described by the ***Ahlswede*** reference clearly fails to teach the claimed "encoding vectors." Therefore, in view of the preceding discussion, it is clear that the present invention, as claimed by independent claim 7 has elements not disclosed in the ***Ahlswede*** reference. Consequently, the rejection of claim 7 under 35 U.S.C. §102(e) is not proper. Therefore, the Applicants respectfully request reconsideration of the rejection of independent claim 7, as amended, and dependent claims 8-9, as amended, under 35 U.S.C. §102(e) in view of the language of claim 7. In particular, claim 7, as amended, recites the following novel language:

"A system for computing a network code, comprising:

a network having a sender node, one or more interior nodes, and one or more receiver nodes, each node having one or more edges connecting to one or more interior nodes in the network;

means for computing a set of ***linear combination coefficients for each edge entering each node, each set of linear combination coefficients representing an encoding vector for each edge for encoding symbols transmitted along each corresponding edge***;

wherein each symbol provides a symbolic representation of one or more encoded bits of data, and wherein ***each symbol belongs to a finite library of symbols***;

means for ***computing a decoding vector for each edge exiting each interior network node from the linear combination coefficients*** of the edges entering each node, wherein each decoding vector is used for decoding symbols transmitted along each corresponding edge;

means for computing decoding matrices for each receiver node of the network from the decoding vectors; and

means for ***constructing a network code*** for at least a portion of the network, including the sender node, each interior node, and one or more of the receiver nodes, ***from the corresponding linear combination coefficients, the corresponding decoding vectors and the corresponding decoding matrices***." (emphasis added)

2.2 Rejection of Claims 16-18:

In general, the Office Action rejected independent claim 16 under 35 U.S.C. §102(e) based on the rationale that the ***Ahlswede*** reference teaches the Applicant's claimed "…computer executable instructions… for computing a network code…"

One important issue in the rejection of independent claim 16 is the definition of the term "representation vectors" as specifically defined by the Applicants. Applicants have amended claim 16 to refer to an "encoding vector rather than a "representation vector,"

and have further defined the terms associated with the claimed "encoding vector." Applicants believe that this, and other clarifying language added to independent claim 16 will assist in a further and more accurate examination of the claims.

In particular, Applicants believe that the clarifying language will assist in a better understanding of how the claimed "encoding vectors" differ from the "R" values described by the ***Ahlswede*** reference. As noted in the Interview Summary dated February 4, 2008, the Examiner suggested that Applicants explain how the representation vectors are not the R values of the ***Ahlswede*** reference. Applicants believe that in view of the amendments to claim 16, this issue has now been clarified.

In particular, the Office Action suggests that the claimed limitation of "computing representation vectors…" is disclosed by the ***Ahlswede*** reference. Specifically, the Office Action offers page 1204 of the ***Ahlswede*** reference and suggests "R is the vector; the symbols are the length of the bits sent." However, as previously noted by the Applicants, the ***Ahlswede*** reference describes the "vector R" as simply the "coding rate" for a particular edge of the multicast network.

In contrast, Applicants are claiming "…computing a set of linear combination coefficients for each edge entering each node, each set of linear combination coefficients representing an ***encoding vector*** for each edge for encoding symbols transmitted along each corresponding edge…" and "wherein each symbol provides a ***symbolic representation of one or more encoded bits of data***, and wherein each symbol belongs to a finite library of symbols…"

As such, the coding rate "R" described by the ***Ahlswede*** reference clearly fails to teach the claimed "encoding vectors." Therefore, in view of the preceding discussion, it is clear that the present invention, as claimed by independent claim 16 has elements not disclosed in the ***Ahlswede*** reference. Consequently, the rejection of claim 16 under 35 U.S.C. §102(e) is not proper. Therefore, the Applicants respectfully request reconsideration of the rejection of independent claim 16, as amended, and dependent claims 17-18, as amended, under 35

U.S.C. §102(e) in view of the language of claim 16. In particular, claim 16, as amended, recites the following novel language:

> "A computer-implemented process, including computer executable instructions stored on a physical computer-readable medium, for computing a network code for a network including at least one sender, a plurality of internal nodes and at least one receiver, comprising using a computing device to:
>
> compute a set of one or more linear combination coefficients for each interior network node and the at least one sender, wherein ***each set of linear combination coefficients represents a corresponding encoding vector for encoding symbols*** exiting a corresponding one of the sender and the internal nodes;
>
> ***compute decoding vectors for symbols*** exiting each interior network node ***from the linear combination coefficients*** corresponding to each interior network node;
>
> ***compute decoding matrices for each receiver from the decoding vectors*** of all internal nodes of the network; and
>
> ***construct a network code from the linear combination coefficients, the decoding vectors and the decoding matrices***." (emphasis added)

CONCLUSION

In view of the above, it is respectfully submitted that claims 7-9 and 16-18 are in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of claims 7-9 and 16-18 and to pass this application to issue. Additionally, in an effort to further the prosecution of the subject application, the Applicant kindly invites the Examiner to telephone the Applicant's attorney at (805) 278-8855 if the Examiner has any additional questions or concerns.

Respectfully submitted,

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